

IN THE CLAIMS:

Substitute the following claims for the pending claims having the same numbers.

1. (currently amended) A system for transmitting downhole data to the surface comprising:

a communications medium operable to provide data transfer to the surface;

a first downhole instrument operably associated with the communications medium, the first downhole instrument being operable to measure a first downhole parameter and transmit first data ~~at a first time~~ relative to the first downhole parameter to the surface via the communications medium; and

a second downhole instrument operably associated with the communications medium and spaced apart from the first downhole instrument, the second downhole instrument being operable to measure a second downhole parameter and transmit second data relative to the second downhole parameter to the surface via the communications medium ,

wherein a first transmitter of the first downhole instrument transmits the first data at a first time, and a second transmitter of the second downhole instrument transmits the second data at a second time such that the first data is interleaved with the second data.

2. (original) The system of claim 1 wherein transmission capabilities of the first and second downhole instruments are substantially simultaneously initialized such that a common reference is defined for specification of the first and second times.

3. (original) The system of claim 2 wherein the transmission capabilities are substantially simultaneously initialized by providing power to the first and second downhole instruments.

4. (currently amended) The system of claim 2 wherein the transmission capabilities are substantially simultaneously initialized by alternating ~~the~~ voltage.

5. (currently amended) The system of claim 2 wherein the first and second downhole instruments employ frequency shift keying to transmit ~~downhole~~ the first and second data.

6. (currently amended) The system of claim 2 wherein the communications medium is ~~a medium~~ selected from ~~the~~ a group consisting of an instrument wire, a coaxial cable and a twisted pair cable.

7. (currently amended) The system of claim 2 wherein the first and second downhole ~~instruments measure a parameter~~ selected from the group consisting parameters are at least one

of temperature, position, pressure, differential pressure and density.

8. (original) The system of claim 2 wherein the first downhole parameter and the second downhole parameter are identical parameters.

9. (currently amended) The system of claim 2 wherein the first downhole ~~instrument~~ parameter and the second downhole ~~instrument~~ parameter measure are different ~~downhole~~ parameters.

10. (currently amended) The system of claim 2 wherein the first downhole instrument periodically measures the first downhole parameter and transmits the first data relative to the first downhole parameter.

11. (currently amended) The system of claim 2 wherein the second downhole instrument periodically measures the second downhole parameter and transmits the second data relative to the second downhole parameter.

12. (original) The system of claim 2 wherein the first and the second downhole instruments further comprise quartz downhole gauges.

13. (currently amended) A system for transmitting downhole data to the surface comprising:

a communications medium operable to provide data transfer to the surface;

a first downhole instrument operable to measure a first downhole parameter;

a second downhole instrument operable to measure a second downhole parameter , the second downhole instrument being spaced apart from the first downhole instrument; and

a first frame associated with the communications medium, the first frame having a first time slot ~~operable to transmit~~ for transmitting first downhole data relative to the first downhole parameter to the surface and a second time slot ~~operable to transmit~~ for transmitting second downhole data relative to the second downhole parameter to the surface ,

wherein a first transmitter of the first instrument transmits the first data in the first time slot, and a second transmitter of the second instrument transmits the second data in the second time slot, such that the first and second data are interleaved.

14. (currently amended) The system of claim 13 wherein transmission capabilities of the first and second downhole instruments are substantially simultaneously initialized such that a common reference is defined for specification of the first ~~time~~ frame.

15. (currently amended) The system of claim 14 wherein the transmission capabilities are substantially simultaneously initialized by ~~previing~~ providing power to the first and second downhole instruments.

16. (currently amended) The system of claim 13 further comprising a second frame associated with the communications medium, the second frame having a third time slot ~~operable to transmit~~ for transmitting the first downhole data.

17. (currently amended) The system of claim 13 further comprising a second frame associated with the communications medium, the second frame having a third time slot ~~operable to transmit~~ for transmitting the first downhole data in response to an event related to the first downhole parameter.

18. (currently amended) The system of claim 17 wherein the event is selected from ~~the~~ a group of events consisting of temperature change, position change, pressure change, differential pressure change and density change.

19. (original) The system of claim 13 wherein, responsive to a timing error, the first and second downhole instruments are reinitialized in order to correct the timing error.

20. (currently amended) The system of claim 19 wherein the timing error is selected from ~~the~~ a group consisting of the

first time slot leading, the first time slot lagging, the second time slot leading and the second time slot lagging.

21. (currently amended) The system of claim 19 wherein reinitializing the first and second downhole instruments further comprises cycling ~~the~~ power OFF and ON to the first and second downhole instruments.

22. (currently amended) The system of claim 19 wherein reinitializing the first and second downhole instruments further comprises alternating ~~the~~ power to the first and second downhole instruments.

23. (currently amended) The system of claim 13 wherein the first and second downhole instruments employ frequency key shifting to transmit the first and second downhole data.

24. (currently amended) The system of claim 13 wherein the communications medium is ~~a medium~~ selected from ~~the~~ a group consisting of an instrument wire, a coaxial cable and a twisted pair cable.

25. (currently amended) The system of claim 13 wherein the first and second downhole ~~instruments measure a parameter~~ parameters are selected from ~~the~~ a group consisting of temperature, position, pressure, differential pressure and density.

26. (original) The system of claim 13 wherein the first downhole parameter and the second downhole parameter are identical parameters.

27. (currently amended) The system of claim 13 wherein the first downhole ~~instrument~~ parameter and the second downhole ~~instrument~~ parameter ~~measure~~ are different ~~downhole~~ parameters.

28. (original) The system of claim 13 wherein the first and the second downhole instruments further comprise quartz downhole gauges.

29. (currently amended) A method for transmitting downhole data to the surface comprising the steps of:

substantially simultaneously initializing first and second downhole instruments for data transmission , the first and second downhole instruments being spaced apart, and the first and second instruments including respective first and second transmitters;

measuring a first downhole parameter with the first downhole instrument;

measuring a second downhole parameter with the second downhole instrument;

transmitting first data relative to the first downhole parameter at a first time from the first ~~downhole instrument~~ transmitter to the surface via a communications medium; and

transmitting second data relative to the second downhole parameter at a second time from the second ~~downhole instrument~~ transmitter to the surface via the communications medium such that the first data is interleaved with the second data.

30. (original) The method of claim 29, wherein the step of substantially simultaneously initializing the first and second downhole instruments further comprises substantially simultaneously providing power to the first and second downhole instruments.

31. (currently amended) The method of claim 29, wherein the step of substantially simultaneously initializing the first and second downhole instruments further comprises substantially simultaneously alternating ~~the~~ voltage supplied to the first and second downhole instruments.

32. (currently amended) The method of claim 29 wherein the step of transmitting first data further comprises ~~the step of~~ employing frequency shift keying to transmit the first data.

33. (currently amended) The method of claim 29 wherein the step of measuring a the first downhole parameter further comprises ~~the step of measuring a parameter selected from the group consisting~~ at least one of temperature, position, pressure, differential pressure and density.

34. (currently amended) The method of claim 29 wherein the step of measuring a the second downhole parameter ~~with the second downhole instrument~~ further comprises measuring the a same parameter as the first downhole parameter.

35. (currently amended) The method of claim 29 wherein the step of measuring a the second downhole parameter ~~with the second downhole instrument~~ further comprises measuring a different parameter from the first downhole parameter.

36. (currently amended) A method for transmitting downhole data to the surface comprising the steps of:

measuring a first downhole parameter at a first downhole instrument , the first instrument including a first transmitter;

measuring a second downhole parameter at a second downhole instrument , the second downhole instrument being spaced apart from the first downhole instrument, and the second instrument including a second transmitter;

~~sending~~ transmitting first data relative to the first downhole parameter from the first transmitter to the surface via a first time slot of a first frame ~~for communication to the surface;~~ and

~~sending~~ transmitting second data relative to the second downhole parameter from the second transmitter to the surface via a second time slot of the first frame ~~for communication to the surface.~~

37. (currently amended) The method of claim 36 further comprising ~~the~~ a step of substantially simultaneously initializing the first and second downhole instruments for data transmission.

38. (currently amended) The method of claim 36 further comprising a step of providing a second frame having a third time slot for transmitting the first downhole data ~~relative to the first downhole parameter for communication~~ to the surface.

39. (currently amended) The method of claim 38 further comprising ~~the~~ a step of sending transmitting the first data in the second frame ~~responsive~~ in response to an event selected from ~~the~~ a group consisting of temperature change, position change, pressure change, differential pressure change and density change.

40. (currently amended) The method of claim 36 further comprising ~~the~~ a step of, responsive to a timing error, reinitializing the first and second downhole instruments.

41. (currently amended) The method of claim 40 further comprising ~~the~~ a step of detecting the timing error from ~~the~~ a group consisting of a leading first time slot, a lagging first time slot, a leading second time slot and a lagging second time slot.

42. (currently amended) The method of claim 40 wherein the step of reinitializing the first and second downhole instruments further comprises cycling ~~the~~ power OFF and ON to the first and second downhole instruments.

43. (currently amended) The method of claim 40 wherein the step of reinitializing the first and second downhole instruments further comprises alternating ~~the~~ voltage to the first and second downhole instruments.

44. (currently amended) The method of claim 36 wherein the step of ~~sending~~ transmitting the first data further comprises ~~the step of~~ employing frequency shift keying to transmit the first data.

45. (currently amended) The method of claim 36 wherein the step of measuring a the first downhole parameter further comprises ~~the step of~~ measuring a ~~parameter selected from the~~ group consisting at least one of temperature, position, pressure, differential pressure and density.